

Atty. Dkt. No. DALHO1340-1  
(028614-1303)

**Listing of Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A composition for the stimulation of protection against infection by at least one pathogen, said composition comprising a live commensal oral organism genetically modified so as to express a plurality of immunogenic fragments of said pathogen.
2. (Original) A composition according to claim 1 wherein said plurality of immunogenic fragments are derived from the same mucosal pathogen.
3. (Original) A composition according to claim 1 wherein said plurality of immunogenic fragments are derived from more than one pathogen.
4. (Original) A composition according to claim 1 wherein said pathogen is *Bordetella pertussis*, Respiratory Syncytial Virus (RSV), poliovirus, *Mycoplasma pneumoniae*, meningococcus, pneumococcus, rotavirus, influenza, parainfluenza, *Corynebacterium diphtheriae*, *Clostridium tetani*, hepatitis B virus, *Neisseria gonorrhoeae*, non-typeable *Haemophilus influenzae*, *Chlamydia pneumoniae*, *Chlamydia trachomatis*, *Moraxella catarrhalis*, or a combination of two or more thereof.
5. (Original) A composition according to claim 1 wherein said pathogen is *Bordetella pertussis*.
6. (Original) A composition according to claim 5 wherein said immunogenic fragment is derived from the pertussis toxin.
7. (Original) A composition according to claim 6 wherein said immunogenic fragment of the pertussis toxin comprises the N-terminal 179 amino acids of the S1 subunit of the pertussis toxin.

Atty. Dkt. No. DALHO1340-1  
(028614-1303)

8. (Original) A composition according to claim 5 wherein said immunogenic fragment is derived from one or more of the pertussis toxin, filamentous hemagglutinin, pertactin and fimbriae.
9. (Original) A composition according to claim 1 wherein said commensal oral organism is a *Streptococcus*.
10. (Original) A composition according to claim 9 wherein said commensal oral organism is *Streptococcus gordonii*, *Streptococcus salivarius* or *Streptococcus mitis*.
11. (Original) A composition according to claim 10 wherein said genetic modification comprises transformation of said *Streptococcus gordonii* with a vector encoding the surface protein antigen P1 of *Streptococcus mutans*, and wherein the sequence encoding said surface protein antigen is modified by insertion of sequence encoding said immunogenic fragment therein.
12. (Original) A composition according to claim 1 wherein said organism is further modified so as to express at least one mucosal adjuvant.
13. (Original) A composition according to claim 1 wherein said composition further comprises at least one immunological adjuvant.
14. (Original) A method for prophylactically treating a host against infection by a pathogen, said method comprising orally and/or intranasally administering to said host an effective amount of a composition according to claim 1.
15. (Original) A method according to claim 14 wherein said plurality of immunogenic fragments are derived from the same pathogen.
16. (Original) A method according to claim 14 wherein said plurality of immunogenic fragments are derived from more than one pathogen.

Atty. Dkt. No. DALHO1340-1  
(028614-1303)

17. (Original) A method according to claim 14 wherein said pathogen is *Bordetella pertussis*, Respiratory Syncytial Virus, poliovirus, *Mycoplasma pneumoniae*, meningococcus, pneumococcus, rotavirus, influenza, parainfluenza, *Corynebacterium diphtheriae*, *Clostridium tetani*, *Neisseria gonorrhoeae*, non-typeable *Haemophilus influenzae*, *Chlamydia pneumoniae*, *Chlamydia trachomatis*, *Moraxella catarrhalis*, hepatitis B virus, or a combination of two or more thereof.
18. (Original) A method according to claim 17 wherein said pathogen is *Bordetella pertussis*.
19. (Original) A method according to claim 18 wherein said immunogenic fragment is derived from the pertussis toxin.
20. (Original) A method according to claim 19 wherein said immunogenic fragment of the pertussis toxin comprises the N-terminal 179 amino acids of the S1 subunit of the pertussis toxin.
21. (Original) A method according to claim 18 wherein said immunogenic fragment is derived from one or more of the pertussis toxin, filamentous hemagglutinin, pertactin and fimbriae.
22. (Original) A method according to claim 14 wherein said commensal oral organism is *Streptococcus*.
23. (Original) A method according to claim 14 wherein said organism is further modified so as to express at least one mucosal adjuvant.
24. (Original) A method according to claim 14 wherein said composition further comprises at least one immunological adjuvant.

Atty. Dkt. No. DALHO1340-1  
(028614-1303)

25. (Original) A method for chronic immunization of a host against infection by a pathogen, said method comprising orally and/or intranasally administering to said host an effective amount of a composition according to claim 1.
26. (Original) A method according to claim 25 wherein said plurality of immunogenic fragments are derived from the same pathogen.
27. (Original) A method according to claim 25 wherein said plurality of immunogenic fragments are derived from more than one pathogen.
28. (Original) A method according to claim 25 wherein said pathogen is *Bordetella pertussis*, Respiratory Syncytial Virus, poliovirus, *Mycoplasma pneumoniae*, meningococcus, pneumococcus, rotavirus, influenza, parainfluenza, *Corynebacterium diphtheriae*, *Clostridium tetani*, *Neisseria gonorrhoeae*, non-typeable *Haemophilus influenzae*, *Chlamydia pneumoniae*, *Chlamydia trachomatis*, *Moraxella catarrhalis*, hepatitis B virus, or a combination of two or more thereof.
29. (Original) A method according to claim 28 wherein said pathogen is *Bordetella pertussis*.
30. (Original) A method according to claim 29 wherein said immunogenic fragment is derived from the pertussis toxin.
31. (Original) A method according to claim 30 wherein said immunogenic fragment of the pertussis toxin comprises the N-terminal 179 amino acids of the S1 subunit of the pertussis toxin.
32. (Original) A method according to claim 29 wherein said immunogenic fragment is derived from one or more of the pertussis toxin, filamentous hemagglutinin, pertactin and fimbriae.

Atty. Dkt. No. DALHO1340-1  
(028614-1303)

33. (Original) A method according to claim 25 wherein said commensal oral organism is *Streptococcus*.

34. (Original) A method according to claim 25 wherein said organism is further modified so as to express at least one mucosal adjuvant.

35. (Original) A method according to claim 25 wherein said composition further comprises at least one immunological adjuvant.

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